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ABSTRACT

This publication of the Community Services Administration is a guide for Community Action Agencies (CAA's) programs for home energy conservation. CAA's involved with renovation of dwellings in poor and depressed areas are given in this guide and step-by-step instructions for administering their weatherization programs. Contents include: (1) a discussion of the problem of low income dwelling weatherization; (2) purpose of the guide; (3) overall guidelines for weatherization programs; (4) requirements and recommendations for the projects; (5) problems that need to be handled from the outset; (6) planning the work on individual houses; and (7) important considerations prior to implementation. Tables include: (1) heating index; (2) optimal combinations of energy conservation techniques by heating index; (3) R-valves and inches, approximate conversions for various kinds of insulation; (4) assumed materials cost; and (5) cost estimates. Forms for building weatherization plans are among the appendices. Although this publication is intended for CAA's, the approach of a building weatherization plan and the methods for realizing such a plan as presented in this guide could well be used by individual homeowners and landlords as well. (MR)

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A Community Planning Guide to Weatherization

Community Services
Administration
Washington, D.C. 20506

September 1975

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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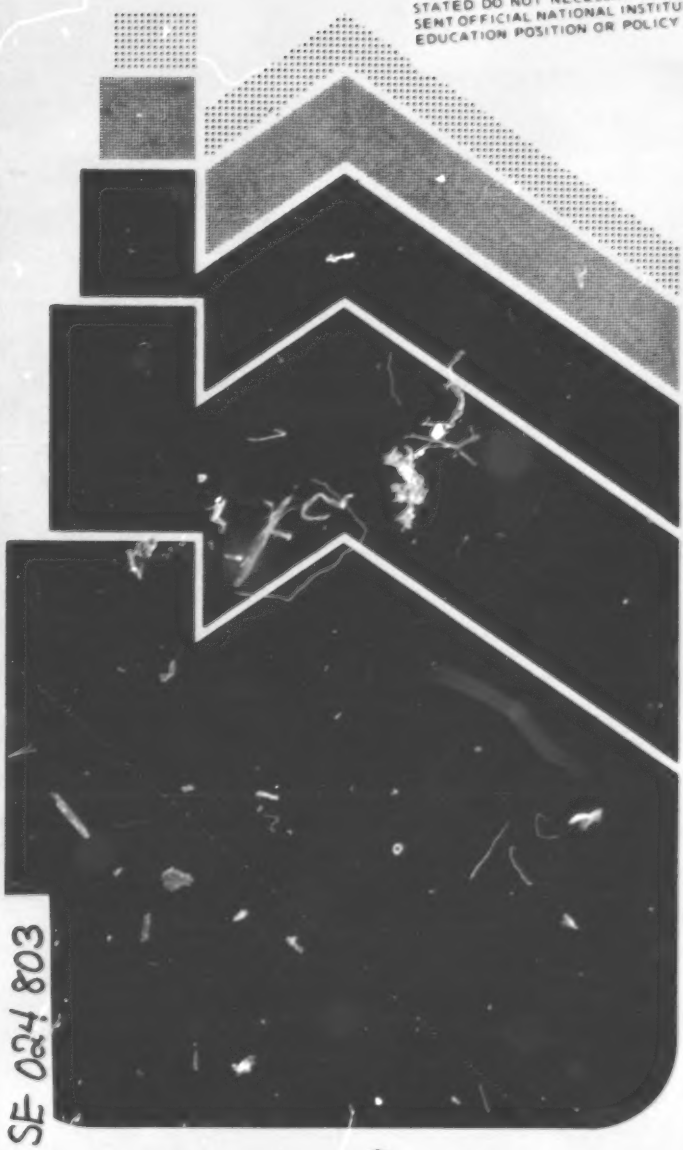

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Acknowledgments

This Guide would not have been possible without the work of the National Bureau of Standards, in particular the efforts of Steve Petersen, who revised the data from his original study, *Retrofitting Existing Housing for Energy Conservation: An Economic Analysis*, to more accurately reflect and respond to the conditions of Community Services Administration constituents.

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The Problem: Some Basic Considerations

Perhaps when time has given perspective to the 1970's, the decade will be characterized as the one in which we realized that we could not continue our mindless destruction of the environment in which we live, polluting its waters and atmosphere, exhausting its supply of fossil fuels. Whatever the impact of this realization, during the next twenty-five years the cost and availability of energy will probably have a more profound effect on our economy, our government, and our lives, than any other single factor. The new realities of limited supply, third world demand, and spiralling cost will call into question the basic assumptions that underlie many of our most important habits, values, aspirations and public policies. The equal protection guaranteed by our Constitution takes on new meaning in the face of scarcity: protection from cold, protection from the cut-off of electricity or gas, protection from waste by others who are using up a resource of which there is already too little to go around.

As usual, the poor are the first to feel the worst pinch. With no luxuries in their budgets or deliberate waste in their habits, there is nowhere to turn when the price of everything goes up. But this time it's different: for it is not only a question of price but also a question of supply. More money will not increase the supply of natural gas when there isn't any more. Poverty, wealth, and standard of living are no longer terms having to do only with the distribution of money. They now concern the distribution of resources—like energy—as well.

The old adage "Waste not, want not" is taking on new meaning for growing numbers of people for whom waste has always been a way of life; as long as they had enough money, they could always buy the "want not" part. In the face of depleted supplies, this practice cannot continue. And, as the CSA weatherization program pioneers in the application of optimal combinations of energy conservation techniques, the poor will have something to demonstrate to the rest of society; the non-poor will have to learn new ways from those who have never been able to afford to waste. And the better the job is done, the more there will be to go around, and the more chance there will be for the poor to get their fair share.

One of the greatest areas of energy waste is in the heating of buildings, which accounts for 25% of all the energy used in this country. This is one area in which the poor—often through no fault of their own—are wasting as much as anybody. For current studies show that the buildings we all inhabit are inadequately weatherized given the existing high prices of energy. This is perhaps the only area where the poor, by eliminating waste, can cut down on their expenses. For a family living in an uninsulated house, relatively simple energy conserving

home improvements can save up to 50% of their energy costs. At the same time that they are saving the precious dollars in their limited budget, they will be helping in the overall problem of conserving the decreasing supply.

Section 222(a)12 provides the Community Services Administration through its Community Action Agencies, a special opportunity to reassume a position of leadership in the meeting of a problem that will eventually be seen to be of vital interest to all. CAAs will be able to lead their communities in the understanding and application of energy conservation techniques required in this time of scarcity and high price. CAAs will have the opportunity to foster training and employment opportunities in the field of weatherization that will have a real and growing future in a context of increasing awareness of the dimensions of the problem. CAAs will have the option of the home weatherization field, expanding the markets for services based on existing technology, and creating new markets out of developing technologies.

It is important that we begin immediately to take advantage of the opportunities this challenge affords us.

(Although Community Action Agencies are referred to throughout this Planning Guide, and as the largest group of CSA grantees are the Guide's principal audience, readers should remember that they are not the only agencies which can administer Emergency Energy Conservation Programs under Section 222(a)(12) of the Community Services Act. Eligible grantees include Community Development Corporations, State Economic Opportunity Offices, and other non-profit organizations serving the poor. These agencies are providing a valuable service in helping to cover those parts of the country not covered by CAAs, and the Guide is designed for their use as well. In fact, it is hoped that portions of the Guide, particularly Part VI, will be useful to the broader community as we all work together to conserve energy.)

Purpose

It is the purpose of this Guide to provide CAAs and others implementing Section 222(a)12 with specific information that will facilitate proper planning for one of the major activities authorized under the Section: weatherization of low-income dwellings. This is not to imply that other activities possible as part of Emergency Energy Conservation Services are not important. However, the large number of CAAs engaged in weatherization activities, the need for explanation of and education about high levels of the various energy conservation measures required, and the complexity of detail surrounding this field of activity, necessitated the preparation of a handbook where all this material could be collected.

In preparing the Guide, we have called on two basic sources of expertise and experience. for technical information and economic analysis through which the standards are derived, we have utilized the recent work of the National Bureau of Standards; for advice about the many details to remember and pitfalls to avoid, we have drawn on the experience of CAAs and others involved in weatherization activities. Of course, this latter source of information can never be completely current, and even as the Guide is prepared there are undoubtedly CAAs in the field who have additional experience which would be of benefit to all. We can only encourage the exchange of this experiential information among all of you so that our collective experience can produce the best results for poor people.

A specific purpose of the Guide is to enable the collection of the considerable body of data which we will need to win friends and influence people about the weatherization needs of poor people and our ability to carry out the long term job of meeting them. Without accurate and adequate information there is a real danger that the poor will be short-changed, that once again they will be expected to be content with less than that which all people deserve. So as you prepare the various information collecting forms required by CSA Instruction 6143-1, remember that information is power, and we need them both in this effort.

Overall Guidelines

While there will be numerous variations among local programs, there are certain over-riding principles which must be followed in all instances. This section sets out those principles which must not be violated in any case. Read them carefully and keep them foremost in your mind as you begin.

A. Plan for the Whole Job

For every dwelling, weatherizing activities should eventually provide the optimal combination of energy conservation techniques, if they are to best serve the needs of the occupant and the nation. However, the level of resources available under the current appropriation will provide only limited funds for each CAA. Thus, in this first year, it will not be possible to complete the job for every building worked on or to work on as many units as need it. But for every building there must be a total plan, prepared at the outset, that will indicate the optimal combination of weatherization techniques for that building, how much is being done the first year at what cost, and how much will remain to be done.

The document evidencing that this planning for the whole job has been done is the Building Weatherization Plan required in CSA Instruction 6143-1. A copy is included in Appendix D of this Guide, and will be supplied in bulk to each grantee.

B. Stop Infiltration First

The first weatherization job that must be done for every building is to stop the escape of heated air through broken window panes, holes in walls, floor and roof, and cracks. These problems of infiltration which you are likely to encounter are many and serious; correcting them alone may use up all the money you can afford to spend on one house in one year. But you must correct the problems of infiltration before any other energy conservation measures are undertaken. Two feet of insulation will reduce the flow of heat through a wall, but all the insulation possible cannot prevent heat from escaping rapidly through cracks, holes, or broken windows, and insulating before correcting these faults is a waste of precious money.

C. Maintain the Balanced Combination of Improvements

An important element of the work of the National Bureau of Standards study is its conclusion that a balanced combination of energy conserving home improvements is the most cost effective. The study shows that, for example, a limited amount of money can be better spent putting in some of each measure rather than a large amount of one type of improvement.

Of course there may be structural limitations on the building in question which would prevent you from doing

one kind of improvement. For instance, wall space may be inaccessible; in such a case, you should still stick to the recommended balance of the rest of the energy-conserving measures.

D. Complete the Optimal Combination of Energy Conservation Measures Before Using Alternative Systems

Thorough weatherization of a house can reduce heating requirements by as much as 50%. After that, alternative energy techniques such as solar collectors can make a much bigger impact on remaining energy needs.

Keep these guiding principles well in mind as you turn to the more specific details of planning your weatherization effort.

Project Design: Requirements and Recommendations

CSA Instruction 6143-1 requires each administering agency to establish a Project Advisory Committee, a majority of whose members shall be poor, and including representatives of local government, other agency resource persons, and a representative or representatives of local public utilities and fuel dealers. The thoughtful selection of members of the Project Advisory Committee cannot be over-emphasized. For the Committee will not only have to work hard and make difficult decisions vis-a-vis your own weatherization efforts; it will also, if properly constituted, have a major leadership role to play in the larger community, educating and influencing the non-poor about the need for the benefits accruing to them from energy conservation.

It will be the role of the Committee to recommend policies for selection of dwellings to be weatherized. In recommending the controlling policy for any CAA, the Committee will have to consider whether to give priority to work on any particular group of constituent homes. Some CAAs have decided that the elderly and families with small children should receive top priority; some agencies have prioritized dwellings on the basis of the type of fuel used, working first on those using fuels in short supply. Your Committee will have to establish its own priorities. Your Committee will need to recommend what amount will be spent on each house, given the funds available, whether to bring a few houses up to the optimal standard, in which cases to approve per house expenditures in excess of the Regional maximum. Your Committee might want to require the labor of an able-bodied person in the household if there is one to assist in the work on the house. Your Committee will have to recommend policies for dealing with rental units. All of these important policy questions, as well as the many local issues that might arise, will have to be considered by the Committee in guiding the weatherization program to its best local outcome.

Staffing is another element of project design which will require your thoughtful attention, but will admit wide varieties of local determination. The implications of the new realities of energy price and supply and of the range of programs authorized under Section 222(a)12 suggest that Community Action will be involved with energy programming for a long time to come, and that CAAs would be well advised to develop strong staff capability in this area. The extent of the need for weatherization alone assures that if the job is to be done properly the amount spent just for materials for the houses of the poor will run into hundreds of millions of dollars over the next few years. CAAs in different parts of the country are already participating in state utility rate proceedings. The field of alternate technology is just beginning to show its potential in areas of housing, employment, and economic development.

For these reasons each administering agency would be well advised to establish and fill a full time position of Energy Coordinator to plan and direct energy programming for the agency. The Energy Coordinator should work closely with the Agency Board, planning the staff activities needed to implement the recommendations of the Project Advisory Committee.

The Energy Coordinator should be familiar with the agency's and the community's housing and manpower programs and resources. Indeed in some cases where budgets would not permit a full time energy coordinator, a housing specialist has taken on this kind of activity. The coordinator should establish good working relationships with the state energy office, local officials having responsibility for energy matters, and local representatives of the fuel and utilities industries, as well as Energy Coordinators for other funded programs in the area.

In addition to an Energy Coordinator, the administering agency will have to provide on-the-job supervisors or crew chiefs to supervise the actual work (Project FUEL in Maine called them "carpenter supervisors"). Where work crews are made up of CETA trainees, the agency can contract with the prime sponsor to obtain funds for trained supervision. Agencies should co-operate with local Building Trades Councils to identify unemployed skilled persons to fill these positions. Similarly, where Summer Youth Program enrollees are employed in work crews, they should have skilled supervision. Provision of skilled supervisors for volunteer labor may prove more difficult, unless Public Service Employment slots can be assigned to these positions.

Finally, there should be a staff capability to develop the Building Weatherization Plan, cost out each job before a crew is assigned, order materials and make sure they are delivered to the job site at the proper time, and assign work crews in the most efficient manner. For smaller programs, this could be done by the Energy Coordinator, even though the actual costing out of the job and weatherization plan development will require some special skills. In larger programs a special position, perhaps of Project Manager, may well be required.

Supplying the labor force to carry out the work on individual houses is an important matter, and one which will be worked out in a variety of different ways, depending on local conditions. CSA Instruction 6143-1 emphasizes the expenditure of funds for materials to be used on low-income dwellings. It anticipates the use of laborers supported by non-CSA funds, CETA trainees, Public Service Employment jobholders, Summer Youth Program enrolees, Title X workers. Experience has shown that paid labor of this kind provides the reliability and continuity necessary to carry out an efficient weatherization project.

However, CAAs and other administering agencies have widely varied experience in the ability to secure such subsidized labor. In some areas it is not a real possibility. Faced with this difficulty, some agencies have tried to use volunteer labor, with mixed results. Use of volunteers can often provide good public relations and can contribute substantially to the development of community support. What must be adequately insured is

their responsible commitment to the job at hand, so that you can count on them to show up at the required time and place to carry out the necessary work. Adequate planning and supervision as well as regularization of volunteers through an effective program such as the National Jaycees Project Mainstream can make the use of volunteer labor an asset while supplying in-kind non-Federal share and providing valuable contacts with different segments of the community.

Provision for the required non-Federal share is another important element of project design. CAAs across the country have once again demonstrated their considerable resourcefulness in securing cash and in-kind contributions for their weatherizing efforts. It would be impossible to mention all of the innovative examples of resource mobilization here; it is sufficient to say that CAAs have secured any kind of material or service that can help fix up houses to keep people warm, saving money and conserving energy.

Other Federal resources which might be used to supplement your CSA supported weatherization project are discussed more fully in Appendix B, but a few points should be stressed here. Many buildings will need extensive renovation such as siding or new roofs as part of the repairs to stop infiltration. Wherever possible, such renovations should be financed through non-CSA sources where they involve expenditures of more than $100. In rural areas, for example, FmHA 504 loans should be used; such loans can finance the cost of the entire weatherization effort where that does not place too heavy a repayment burden on the homeowner. (The 504 loan program is discussed in greater detail in *Coping With The Energy Crisis*, OEO Pamphlet 6143-3.)

Administering agencies and SEOOs should work together to develop programs with FmHA State Directors whereby CAAs can provide assistance to FmHA County Loan Officers in the actual packaging and processing of 504 loans which can greatly increase the volume of loans as well as shorten the time between application and payment. Also, there is no reason not to use weatherization program funds as advances on approved 504 loans in order to permit immediate start-up of the job while awaiting completion of the 504 loan processing.

Selection, purchase and distribution of materials is another matter that will influence project design. To assure quality and acceptable standards of safety and effectiveness, make sure that all materials meet government specifications. If you have any problems in making this determination it is recommended that you seek advice from one of the manufacturers associations listed in Appendix C, rather than from the manufacturer itself. Certain insulation materials can create health hazards if carelessly or improperly handled during installation. Be sure that you follow all directions provided by the manufacturer for use and handling of such materials.

Although bulk purchase of materials on an area-wide or state-wide basis sounds attractive as a way of reducing costs, past experience has indicated otherwise. Transportation of materials from the central purchasing location to remote program areas has proved to be costly as well as being an administrative headache

which frequently caused inefficient use of manpower because of the breakdown in coordination in the delivery of materials to job sites at the proper time. Perhaps more important has been the positive community support for weatherization projects when materials are purchased from local dealers. Experience in several projects has been that substantial discounts are usually obtainable from local dealers, and that any financial difference here is more than offset by timely delivery of materials, by the goodwill and support generated in bringing business to a depressed segment of the local economy, and by the resultant increase in local in-kind support for the program.

All these factors differ from community to community, but it would be wise not to assume automatically that central bulk purchasing is necessarily the best answer. Investigate the options before making a decision.

Threshold Problems

Experience has shown that every grantee or administering agency will encounter a number of pesky, threshold problems, which, if not properly handled at the outset of the project, could well be seriously detrimental later. A few of these matters are discussed below; you may well run into some others. Remember that attention to this kind of detail is necessary for a high-quality long-term effort.

A. Registration Requirements

An increasing number of states have enacted laws requiring the registration and licensing of companies in the home improvement business. This is because of the past history of violations in this area. If your state has such a law on your community has such an ordinance, you should check with the Attorney-General or the County or City Attorney to make sure that you will not be in violation of such a law. It should not be difficult to get a ruling that exempts you from such regulation, but it is far better to clear the matter up in advance than to be delayed later by the zealous enforcer.

B. Truth-in-Lending Laws

If your program involves a loan fund of any kind, secure and review applicable Truth-in-Lending Laws. It is unlikely that your loan program will be hampered by such laws, but it is important to assure compliance right from the start.

C. Liability Insurance

It is imperative that you have liability insurance to cover the crews and volunteers working on the buildings. If possible work with the SEOO in your state to purchase a state wide policy. The rates will be much lower that way.

D. Relationships with the Building Trades

Unemployment among the building trades is extremely high, and it is important that your project not be looked upon as taking jobs away from unemployed carpenters and builders. Three things that you should do are:

1) First, talk to your local Building Trades Council officials and point out that your program is not engaged in actual construction, but only the weatherization of poor people's houses, and that your clientele is not in any case a potential client for the building or home repair industry since they are too poor.

2) Second, wherever possible hire unemployed union members for your supervisory positions and work through the union to hire them

3) Third, work through your Advisory Committee and the Building Trades Council, which you may want represented on your Committee, to publicize the need for better weatherizing in all houses.

The work of the National Bureau of Standards described in Part VI of this Guide should be very helpful in demonstrating that added weatherization is not only an important energy saver but a sound dollar investment as well. A successful community-wide energy conservation campaign can be most important to your constituency as well, particularly if local shortages in energy supply threaten to shut down industry and cause increased layoffs.

E. Working on Rental Units

The question of whether to work on renter-occupied units is a difficult one on which your Project Advisory Committee will have to formulate local policy recommendations.

In most cases where work was done on such dwellings, agreements were sought that would prevent the landlord from penalizing the renter with higher rents for the improved property. Project FUEL in Maine was able to get some landlords to sign an agreement that they would not raise the rent for a period of years after the work was completed, or that they would reduce the rent for the coming year by the value of the materials put into the dwelling. This latter arrangement is required if CETA employees are to work on rental property.

Part VI

Planning the Work on Individual Houses: Determining Program Standards and Preparing Building Winterization Plans

Planning the work on individual houses in your area will be the cornerstone of your weatherization program. And this essential planning will have an important dual function:

1) First, it will enable you, and through you CSA at large, to document the total need for weatherization work on poor people's houses; only by clearly delineating the size of the job to be done will we ever be able to convince decision-makers of the need for the funds to do it
2) Second, it will provide you with a practical record of the progress you have made toward bringing each house up to the optimal levels which have been determined as your program standards.

These house-by-house planning activities will have both a practical local and a national informational utility. It is important that you carry them out accurately and completely.

A decision has been made by CSA that the setting of standards which will serve as the final goals to be achieved on individual houses shall reflect an agency commitment to do a quality job for poor people. We will not be satisfied with a hasty or slipshod job which will not produce significant savings in energy costs over a long period of time.

CSA has been very fortunate in securing information and technical assistance from the National Bureau of Standards to help us carry out this task. NBS recently completed a study which describes, from the viewpoint of economics, the usefulness of various combinations of energy-conserving home improvements in reducing energy costs in existing housing. The results of the study may be surprising, to you and to the public in general. For example, did you know:

that most of the 40 million owner occupied houses in this country could use additional insulation to offset sharply rising energy prices?

that the higher the cost of energy, the greater will be the savings from increased energy conservation improvements, so that even in the same climate houses with different energy sources require different levels of improvements?

that insulation is usually a good idea in geographic areas that require a lot of cooling, even if heating requirements are low?

that the best combination of energy conservation improvements depends equally on climate and energy prices, so that when prices for home heating oil doubled in Washington, D.C., the effect on a homeowner's heating bill was the same as physically moving his house to Minnesota?

that an unbalanced combination of improvements could be a waste of money?

The NBS study shows that everyone has a lot to learn about energy conservation in these times of high prices and dwindling supplies. Make sure that your planning reflects this improved and up-to-date knowledge.

Although it is stated earlier in the overall guidelines, one of the important planning principles is well worth mentioning again. That is, the first and most basic point to remember is that the problems of infiltration which you are likely to encounter must be solved before any other energy conservation measures are undertaken. Cracks, broken windows, holes in floors and roofs, etc., must be repaired first, because no combination of other more expensive home improvements can be effective until the rapid loss of heated air through these basic flaws is stopped.

When the more serious problems of infiltration have been corrected on an individual house, you should plan for the application of weather stripping and caulking to exterior window and door frames. Regardless of your climate or the cost of energy used in the various houses on which you are working, weather stripping and caulking are economical. Proper application of these energy conservation techniques will reduce not only heat loss, but also uncomfortable drafts.

Once you have planned for the stopping of infiltration on a house including the application of weather stripping and caulking, you are ready to set up your plan for work toward the optimal combination of energy conserving home improvements which are indicated for your climate and energy costs. CSA Instruction 6143-1 requires that you specifically state that ultimate goal by preparing a model of the optimal combination of energy conservation techniques which ought to be achieved in a 1200 square-foot house in your area. In order to find that model, you must first have information about the two local conditions that determine economical conservation expenditures.

Step One: Find your Heating Index

You must have information about the climate in your area; for our tables this is expressed in degree-days. If you do not already know the degree-days for your location, you can call your local fuel dealer and ask for the information.

You must have information about the cost of energy in your area. You can find this out from local fuel dealers or utility companies. Make sure that the costs quoted to you include all taxes, surcharges and fuel adjustments that are actually charged, and make sure that unit costs are expressed in the same manner as those in Table I.

Once you know your climate and energy cost factors, you will use Table I to find your Heating Index. Find

Table I: Heating Index

Type of Fuel:																	Type of Fuel:	
Gas (Therm)		11¢	14¢	18¢	21¢	25¢	27¢	29¢	31¢	35¢	41¢	51¢	61¢	72¢	82¢	$1.03	$1.23	Gas (Therm)
Oil/Kero (Gallon)					30¢	34¢	37¢	40¢	43¢	50¢	51¢	71¢	86¢	$1.00	$1.15	$1.44	$1.72	Oil/Kero (Gallon)
Electric (kWh)					1¢	1.2¢	1.3¢	1.4¢	1.5¢	1.7¢	2¢	2.5¢	3¢	3.5¢	4¢	5¢	6¢	Electric (kWh)
Coal (Ton)		$21	$28	$35	$42	$49	$53	$57	$62	$70	$82	$102	$123	$144	$164	$205	$246	Coal (Ton)
Degree Days	1000	2	2	3	3	4	4	4	4	5	6	7	9	10	12	15	18	1000
	2000	3	4	5	6	7	8	8	9	10	12	15	18	21	23	29	35	2000
	3000	5	6	8	9	11	11	12	13	15	18	22	26	31	35	44	53	3000
	4000	6	8	10	12	14	15	16	18	20	23	29	35	41	47	59	70	4000
	5000	8	10	13	15	18	19	21	22	25	29	37	44	51	59	73	88	5000
	6000	9	12	15	18	21	23	25	26	30	35	44	53	62	70	88	105	6000
	7000	11	14	18	21	25	27	29	31	35	41	51	61	72	82	103	123	7000
	8000	12	16	20	24	28	30	33	35	40	47	59	70	82	94	117	141	8000
	9000	14	18	23	27	32	34	37	40	45	53	66	79	92	105	132	158	9000
	10000	15	20	25	30	35	38	41	44	50	59	73	88	103	117	147	176	10000

Table II: Optimal Combinations of Energy Conservation Techniques By Heating Index

Heating Index	Attic Insulation	Wall Insulation*	Floor Insulation**	Duct Insulation	Storm Doors	Storm Windows*** Long Life $25	Long Life $8	Long Life $4	Short Life $25	Short Life $5	Short Life $4
1-3	R-0	0	0	R-8			None			None	
4-6	R-11		0	R-8							
7-10	R-11		R-11	R-8	None	None	20	15			
11-12	R-19	Full	R-11	R-8		20	15	10	None	20	15
13-15	R-19	Wall	R-11	R-8		15	12	8	None	20	15
16-19	R-30	Insula-	R-19	R-16		12	9	6	20	15	10
20-27	R-30	tion	R-19	R-16	Optional	9	7	5	15	12	8
28-35	R-33	R-11	R-19	R-16	Optional	6	5	all	12	9	6
36-45	R-38	to		R-24		4	all	all	9	7	5
46-60	R-44	R-14		R-24					6	5	all
61-85	R-49		R-22	R-32	all		all		4	all	all
86-105	R-57			R-32	doors		windows			all	
106-130	R-60			R-32						windows	
131-	R-66			R-40							

* Insulation blown into walls

** Floors over unheated areas

*** Minimum economical size in square feet of window to be covered

$25.00 window is triple track (long life = 15 years; short life 7.5 years)
$ 8.00 window is double plastic (long life = 5 years; short life 3 years)
$ 4.00 window is single plastic (long life = 5 years; short life 3 years)

the horizontal row for your degree-days; find the vertical column which shows the fuel cost per unit which is closest to yours. The number at the intersection of this row and this column is your Heating Index.

The Heating Index is the only number you will need in order to use Table II and determine the model of the optimal combination of energy conservation techniques for a 1200 square-foot house in your area. So be sure you have the right Heating Index. Once you have this number, you can use Table II to get the model.

Some grantees, however, may need more than one Heating Index. If your area includes climatic variations of more than 1000 degree-days, as will be the case in some state-wide programs, or, if your constituents use different kinds of fuel supplied at different prices, you will need a Heating Index for each set of circumstances.

Step Two: Find the Optimal Combination of Energy Conservation Techniques for your Heating Index

After you have found the proper Heating Index number from Table I, you are ready to use Table II to find the model. Locate the Heating Index in the left-hand column and read straight across the page to see what amounts of each energy conservation technique make up the optimal combination. Energy savings result when we cut down the flow of heat from inside the building. The resistance, or "R" value of insulation tells how well it can decrease the heat flow. Two different kinds of insulation

Table III:

R-Values & Inches: Approximate Conversions for Various Kinds of Insulation

	Attic Insulation			Duct Insulation		Insulation Under Floors	
	Mineral Fiber Batt/Blanket	Mineral Fiber Loose-Fill	Cellulose Loose-Fill				
R-11	4"	4-6"	2-4"	R-8	2"	R-11	4"
R-19	6"	8-10"	4-6"	R-16	4"	R-19	6"
R-30	10"	13-15"	7-9"	R-24	6"	R-22	7"
R-33	11"	14-16"	8-10"	R-32	8"		
R-38	12"	17-19"	9-11"	R-40	10"		
R-44	14"	19-21"	11-13"				
R-49	16"	22-24"	12-14"				
R-57	18"	25-27"	14-16"				
R-60	19"	27-29"	15-17"				
R-66	21"	29-31"	17-19"				

may have the same thickness, but the one with the higher R value will do a better job of cutting down heat flow. Recommendations on Table II are listed in terms of R values. Approximate corresponding thicknesses in inches for various kinds of insulation are shown in Table III. Precise R values for different thicknesses of insulation are generally made available through the manufacturer.

Step Three: Preparing Building Weatherization Plans

In order to fill out the Building Weatherization Plan you will have to make a site visit to the dwelling on which work is to be done. This visit should be made by your "carpenter-supervisor" or someone in a comparable position who will have the practical knowledge to make accurate judgments about what has to be done to stop infiltration and who will be able to find out what the existing levels of insulation are in the structure.

Whoever makes the site visit and collects the information for the Building Weatherization Plan must do so accurately and completely. Obviously the occupants of the house will have to co-operate in supplying the information necessary to assess the needs and make plans for the work on the house. This is a good time to begin the educational and informational processes that will lead to understanding and acceptance of the overall goals toward which you are working. It is an important time to start making sure that occupants understand fully what is to be done to their house and why.

The Building Weatherization Plan consists of two sides of a legal-size sheet of paper which can be put in a clip-board or notebook. Side one has three parts which describe the building, the heating system and energy costs, and infiltration problems. Side two has five columns which describe the optimal insulation requirements, the present condition, what is needed to bring the building to optimal, what will be done this year, and what will still need to be done after this year's job is completed.

Fill out Part I, Building Description, by checking the spaces in front of the terms which appropriately describe the structure. Be sure to measure the length and width of the building, so you can compute the floor area. Be sure to count and measure windows, doors, and exposed heating ducts. All of this information will be needed to cost out the job, so completeness and accuracy are important.

Fill out Part II, Heating System and Energy Cost Information. First check the spaces in front of the terms which describe the type of fuel used, the type of heat produced, and if and how hot water is provided in the house. If more than one kind of fuel is used, note the main source with a P, and the back-up source with an S.

This section also asks for cost information, which will be necessary later on to demonstrate savings in cost and usage. It would be helpful if the occupants would be willing to show you old fuel bills in order to get this information and it would be helpful if you could persuade them to save their fuel bills in the future so comparisons could be made. Make sure you indicate the month and

year for which cost information is provided. It should be a month during the heating season.

Part III, Infiltration Problems, describes the condition of those components of the building where flaws causing rapid loss of heat are likely to occur. For each of the listed structural components you should circle the phrases which best describe the condition of that part of the house. If one feature of the house is in worse condition than any of the descriptions, make notes which describe the condition. Since stopping infiltration is the first task to be accomplished on any dwelling, this is the first item to be costed out. Note the materials needed. Make sure that your information is adequate to do accurate repair costs.

The second page of the Building Weatherization Plan is the blueprint for how you will work toward achieving the optimal combination of energy conservation techniques on this particular house. While you are making the site visit, make sure that you secure the information that describes the existing levels of insulation, weather stripping, caulking, storm windows and doors on the house. Other computations may be done in your office if that is more convenient, but do make certain that you have collected all the information you need at the site so that you don't have to repeat the visit unnecessarily.

In filling out page 2 of the Building Weatherization Plan, be sure to enter the Heating Index from Table I which fits the house. Then use Table II to get the model and transfer this information to Column I. You will notice that Table II gives you the R value of insulation for attics, floors, walls and ducts. Table III gives you the approximate number of inches of the various types of insulation that will achieve that R value. You should fill in both the R value and the number of inches of insulation required. Column II should be filled out with the information gained from the site visit, reflecting the existing levels of energy conservation measures which you found at the house.

The difference between Column I and Column II will show how much needs to be done on the house to bring it up to the optimal level. This difference should be shown in Column III. Column III also includes data that will enable you to determine the cost of bringing this particular house up to the optimal level. Figure out the cost per square foot for the number of inches you need to add. Then multiply this by the number of square feet of floor space which you need to cover. This will give you the cost of achieving the optimal level for each measure. By adding the cost for the optimals of all the energy conservation techniques, you will come up with the total cost of materials required to achieve the optimal combination on this particular house.

The total cost of materials needed to bring the house up to the optimal level of energy-conserving home improvements is not the only item to be considered in the per-house budget. You must add to this total of the items in Column III, two other figures in order to get the full cost per house. Add any labor costs which must be paid for out of project funds; these costs will come up when you have not been able to secure labor subsidized from another source or to utilize volunteers. You should also add in any costs associated with stopping

Table IV:

Assumed Materials Costs

Attic Insulation (All Materials)

1¢ per R per square foot

Wall Insulation

40¢ per square foot of net wall area, if installed bya contractor; figure 1¢ per R per square foot for materials, if installed by CAA

Floor Insulation

1¢ per R per square foot

Duct Insulation

2¢ per R per square foot

Storm Windows

$25 (triple track—permanent type
$ 8 (double plastic—temporary type)
$ 4 (single plastic—temporary type)

Storm Doors

$30

infiltration which have been paid for by the project. This will give you the total cost of doing the best possible job of weatherization on this house.

You will probably find that this figure is considerably higher than the Regional maximum for your area. But if if your Committee decides that this or other houses ought to be brought up to the optimal level for demonstration and educational purposes, it may approve such work provided written justification is put on file specifying the reasons for the decision.

You may find that the figure is above the amount which you can afford to spend on a single house, given the amount of funds you have received and the number of houses on which you want to work. If this is the case, you can make downward adjustments which will bring the work within your budget and at the same time maintain the balance of energy conservation techniques which will assure the wise use of funds. It may be that the costs of stopping infiltration alone are all that you can afford. If that is the case, you will stop the infiltration this year, and plan additional work on this house for upcoming years. You have done the best you can with the available funds and the stopping of serious problems of infiltration should result in considerable savings for the occupants.

Suppose, however, that the costs for stopping infiltration are very low, and you still have some additional monies which can be budgeted for this house. How should you decide to spend funds that will produce less than the optimal level, but which can make some improvements in the dwelling?

Table V provides you with some cost estimates that will help you to figure out which balanced combination is best for a limited budget. Be sure to read and understand the notes to Table V before you try to use it; otherwise, it may be confusing to you. Basically, Table V gives various cost estimates by Heating Index. When you find a cost estimate that is appropriate and which you can afford to spend on the house, read back horizontally across the page to see what Heating Index it applies to. Then go back to Table II and find the balanced combination which goes with that Heating Index. Even though this will not be the optimal combination for your area, it will be the balanced combination which you can afford. Fill in Column IV on your Building Weatherization Plan with the recommended levels for each energy conservation technique which you find in this horizontal row. Note that you should not change your Heating Index; you are simply finding the less expensive balanced combination which you can afford this year.

Column V is the difference between Column III and Column IV. To get the information for Column V and a picture of the job that remains to be done, subtract Column IV items from Column III items. Of course, if stopping infiltration took up all your funds, Column IV will be zero and Column V will be the same as Column III. In any case, Column V will let you figure up the amount of funds that will be necessary to do a good job on this house, when you get the funds to do it.

There may be structural limitations on the building which make it impossible or impractical to achieve the optimal levels. For instance, insulation cannot be added under floors in houses built on concrete slabs. In such cases, the other recommended improvements should still be added to the extent indicated on Table II. Similarly, R-30 insulation may be recommended for an attic although only R-19 may fit at the eaves or where the attic is floored. In this case, make recommended improvements insofar as possible, but when structural constraints intervene, come as close as you can on that improvement and be sure to maintain the balance on other recommended levels.

You should now be able to complete the required Building Weatherization Plan for each dwelling unit on which you are working. A good job on this will facilitate planning, enable important data collection, and provide a working plan for scheduling of work crews. From it information needed for purchase and delivery of materials and records of accomplishment can be derived. This is your most specific planning document and you should make it work for you.

Finally, on the lower left-hand side of the Building Weatherization Plan there is a box titled *Completion Data.* It is very important that this be filled in with date, cost of the job, and the man-hours and source of labor that was used. Note that you are asked to indicate whether the job was done as described in Column IV. If not, then Column V must be changed to conform to what actually remains to be done to bring the house to optimal level.

You will be asked to make copies of the Building Weatherization Plans and forward them to CSA periodically so that information contained in them can be tabu-

lated. For this reason, as well as for your own needs, it is important that they be filled in completely and accurately. The information which we gather in this way will be the first hard data which accurately describes the dimensions of the energy problems faced by the poor and what it is going to take to deal with them adequately.

Table V: Cost Estimates

Heating Index	Cost per sq. ft. all insulating materials[1]	Cost per sq. ft. attic and floor insulating materials[2]	Total cost of materials[3]	Total cost of materials excluding wall insulation[4]
1-3	.16	.0	12.00	12.00
4-6	.39	.11	212.00	122.00
7-10	.50	.22	322.00	232.00
11-12	.58	.30	434.00	344.00
13-15	.58	.30	458.00	368.00
16-19	.93	.49	676.00	586.00
20-27	.93	.49	706.00	616.00
28-35	.96	.52	760.00	670.00
36-45	1.20	.60	882.00	792.00
46-60	1.26	.66	942.00	852.00
61-85	1.47	.71	1,004.00	914.00
86-105	1.55	.79	1,084.00	994.00
106-130	1.58	.82	1,114.00	1,024.00
131-	1.80	.88	1,186.00	1,096.00

***Notes to Table V: Be Sure To Read This Page Before Using Table V**

In order to compute the various cost estimates that will be useful to you, certain general assumptions had to be made. Make sure you remember them.

[1] all costs are computed assuming that there is no existing insulation on the house; if there is some existing on your house, your cost will be lower.

[2] All total cost estimates about the house use the following dimensions and characteristics.

Floor area—1000 sq. ft.
Wall area— 750 sq. ft.
Heating ducts are 25 ft. long and 2 ft. around, for an area of 75 sq. ft.

Windows	Number	Size
	4	15 sq. ft.
	3	12 sq. ft.
	2	9 sq. ft.
	3	6 sq. ft.
Doors:	2	

[3] all total costs are computed assuming the availability and use of an $8.00 storm window.

cost of wall insulation, where included, is for materials only and is computed at 12¢ per square foot

1. Column I gives the total cost per square foot for all insulating materials, i.e. attic insulation, wall insulation, floor insulation; duct insulation.
2. Column II gives the cost per square foot for attic and floor insulation; it is appropriate to use this Column if you do not have the capability to do the walls, and if there are no exposed heating ducts.
3. Column III gives the total cost of materials for a 1,000 sq. ft. house.
4. Column IV gives the total costs of materials, excluding wall insulation, for a 1,000 sq. ft. house.

REMEMBER, THESE ESTIMATES DO NOT INCLUDE COST OF STOPPING INFILTRATION!

Things You Should Know Before You Proceed

The recommended levels of insulation and other energy conservation improvements in this Guide will only return the maximum energy and dollar savings if they are properly installed. We are not in a position to provide a step-by-step description of proper installation procedures for each of the techniques. You will have to hire workers who can provide you with these skills. But there is some basic information which you should know before you proceed with investments in energy conservation improvements.

Insulation Ratings

It is always best to select insulation on the basis of cost per resistance unit the so called "R" value (usually made available by the manufacturer)—rather than on cost per inch. Durability and resistance to flame spread and vermin should also be considered.

Energy savings are provided by resistance to heat flow and not thickness per se. Two different kinds of insulation may have the same thickness but the one with the higher R value will perform better. For example, loose-fill mineral fiber (glass fiber or rock wool) insulation may have an R value as low as 2.2 per inch, while mineral fiber batts have an R value of about 3 per inch. Even if batts cost 30 to 40 percent more than loose fill per inch, they might be a better investment.

Insulation batts are generally available in R-11 (about 4 inches thick), R-19 (about 6 inches), and R-22 (about 7 inches). If more than R-19 is recommended, batts should be combined to make up the desired resistance. For example, R-30 may consist of an R-11 and an R-19 batt. Note that R values are additive.

When adding insulation batts to existing insulation, you may not be able to get to our recommended levels exactly. In this case, try to get as close as you can—a little under or over won't make a large difference in your net savings.

Moisture Control

Insulation batts can be purchased with or without a "vapor barrier." This is the paper or foil covering on one side of the batt. The barrier retards water vapor, normally present in the house, from passing through or condensing in the insulation. The vapor barrier should face the living quarters of the house, unless a competent air conditioning specialist advises otherwise.

When combining batts or adding batts to existing insulation, additional vapor barriers should not be used beyond the barrier immediately facing the living quarters. If batts without vapor barriers cannot be found or cost more than faced batts, strip off the vapor barrier or slash it to allow any water vapor to pass through freely.

Before you install insulation in closed cavities (such as wallspaces), consult an insulation specialist about possible moisture problems. If water vapor is allowed to condense in the insulated space, it will lower the performance of the insulation and could damage the structure. In general, moisture problems can be prevented with proper installation of vapor barriers and adequate ventilation but high humidifier settings should be avoided.

Insulation in Attics and Crawlspaces

Two basic kinds of insulation are available for floors of unheated attics. Both will do the job if they are properly installed. One type is preformed mineral fiber (glass fiber or rock wool) batts or blankets. The other type is cellulose or mineral fiber in loose-fill form.

When installing insulaton in attics, you don't have to stop at the ceiling joists if the attic has no flooring, but insulation should not touch the roof at the eaves.

Preformed insulation batts may be more economical than loose-fill materials in an unobstructed attic area without flooring, if they fit snugly between the joists. They can be laid out easily and there is no need to staple them down.

Density of loose-fill insulation is extremely important in assuring the proper resistance to heat flow. The manufacturer will generally specify the number of bags of loose-fill materials needed to achieve a given R value over a specific area. If a contractor is insulating the attic you should verify that the proper number of bags has been used.

A well-insulated attic should also be well ventilated to prevent moisture accumulation problems. Never block ventilation ports and always provide at least two vent openings, located in such a way that air can flow in one and out the other. A good rule of thumb is to provide at least one square foot of opening for each 300 square feet of attic floor area.

Insulation Under Floors

Floors over unheated areas, such as crawlspaces, garages, or basements, can be a major source of heat loss in an otherwise well-insulated house. Everyone knows that hot air rises, but remember, heat flows to cold through solid surfaces in any direction—up, down, or sideways.

Water pipes in unheated areas should also be insulated if there is danger of freezing after the floor insulation has been installed.

Once the area between the joists is fully insulated, the greatest source of heat loss in the attic is through the joists themselves, which may cover as must as 10 percent of the attic. For this reason, when adding insulation batts above the level of the ceiling joists, cover the joists completely if possible.

If you want to add R-19 or R-22 insulation to existing insulation, it is usually best to add R-11 batts up to the level of the joists and cover the entire area with another layer of R-11 batts. Place the batts as close together as possible to prevent air from circulating between them.

Loose-fill insulation may be better if the access to your attic is difficult or if it has a floor. If flooring is present in an otherwise unfinished attic, you may have to remove some of it temporarily to allow insulation to be blown in. Loose insulation is usually blown into the attic through flexible tubing by a small machine which puffs up the insulation as it pushes it through the tube. This may cause some settling after the insulation is in place so you should take that into account when measuring the depth. Small holes should be drilled into tight fitting flooring at one-foot intervals to allow passage of any water vapor that may rise from the rooms below.

Crawlspaces can be closed off in winter, but must be well ventilated in summer to prevent the build-up of moisture from the rooms above. In many areas it is a good idea to cover the ground under a crawlspace with plastic sheeting to reduce the moisture level in this area.

Appendix A:

Section 222(a)12, Community Services Act of 1974

"... a program to be known as 'Emergency Energy Conservation Services' designed to enable low-income individuals and families, including the elderly and the near poor, to participate in energy conservation programs designed to lessen the impact of the high cost of energy on such individuals and families and to reduce individual and family energy consumption. The Director is authorized to provide financial and other assistance for programs and activities, including, but not limited to, an energy conservation and education program; winterization of old or sub-standard dwellings, improved space conditioning, and insulation; emergency loans, grants, and revolving funds to install energy conservation technologies and to deal with increased housing expenses relating to the energy crisis; alternative fuel supplies, special fuel voucher or stamp programs; alternative transportation activities designed to save fuel and assure continued access to training, education, and employment; appropriate outreach efforts; furnishing personnel to act as co-ordinators, providing legal or technical assistance or otherwise representing the interest of the poor in efforts relating to the energy crisis; nutrition, health, and other supportive services in emergency cases; and evaluation of programs and activities under this paragraph. Such assistance may be provided as a supplement to any other assistance extended under the provisions of this Act or under other provisions of Federal law. The Director after consultation with the Administrator of the Federal Energy Office and appropriate Federal departments and agencies shall establish procedures and take other appropriate action necessary to insure that the effects of the energy crisis on low-income persons, the elderly, and the near poor, are taken into account in the formulation and administration of programs related to the energy crisis."

Appendix B:

Other Federal Resources (Useful in Energy Programming)

I. Department of Health, Education and Welfare (HEW)

While programs administered by HEW apply principally to recipients of Aid To Families With Dependent Children (AFDC) (42 U.S.C. 602, et seg.) there are several which are available for others than AFDC recipients. The potential of these programs in the energy area is considerable and CAAs, consumer groups and voluntary organizations should, therefore, be aware of them

A. AFDC (Section 403 of the Social Security Act)

1. Increased Subsistence Needs

The basic AFDC allotment to families may be increased by each State at the State's discretion. The procedure for such an increase is a relatively simple one, requiring the State to file an amendment to its existing plan with the Department of Health, Education and Welfare.

In order to increase the basic subsistence payment, States must be willing to increase the amount of their matching share. AFDC subsistence payments are supported through a 75 percent Federal share and 25 percent non-Federal matching share.

2. Special Needs Standard

To meet increased energy costs, States may also establish a special needs category for energy. Such a category could directly reimburse AFDC recipients for their increased energy costs or could be an estimate of the average energy cost increase for its AFDC population. For example, New York State has computed an average special needs payment for each welfare district on the basis of degree-days, average space required for each family, and average increased cost of various space-heating fuels. As with subsistence needs, there is a 25 percent non-Federal matching share for special needs costs.

3. Insulation

AFDC recipients are also eligible for payments to insulate or winterize their homes (42 U.S.C. 1319). The amount paid may be up to $500, which can be used for labor or materials. This program is now operating in a limited number of States and requires a 50 percent non-Federal share. In order to receive payment, a finding must be made that the home is so defective that continued occupancy is unwarranted; unless repairs are made, rental quarters will be necessary; and the cost of rental quarters will exceed the cost of repairs to the home. It also appears that this authority could be used to pay for the cost of conversion to another form of heat. Homes must be owned by a person receiving AFDC.

4. Emergency Assistance Program (EAP)

The Emergency Assistance Program is now available in approximately 29 States, although all States are eligible for the program. EAP payments require a 50 percent non-Federal matching share. EAP payments are available not only to AFDC recipients, but to any family with "dependent children" who are not now technically eligible for AFDC. Emergency payments may be made for costs accrued over any 12-month period, and, consequently, such payments could be used to pay off back fuel bills which have accumulated over the past 12 months, or to pay off back fuel bills and estimated future bills, as long as payments could be attributed to any consecutive 12-month period. Emergency assistance is authorized under 42 U.S.C. 606

and is available where a dependent child "is without available resources, (and) the payments, care, or services involved are necessary to avoid (his) destitution . . . or to provide living arrangements." Accordingly where a family is without money, and is being refused fuel, gas or electricity because of back bills, such a family could be eligible for Emergency assistance.

5. Services

(a) Regular

AFDC recipients as well as former and potential AFDC recipients and recipients of Supplemental Security Income are eligible for two types of services which have relevance to the energy area. Both require a 25 percent non-Federal matching share. These services are as follows:

Housing Improvement Services (45 C.F.R. 221,9(b)13

Services to help families obtain or retain adequate housing. They include such things as education or direct assistance in locating fuel dealers, and arranging for insulation or other repairs. Crisis programs, such as those operated by State Energy Offices or CAAs, where emergency fuel deliveries were arranged would also appear covered. These services may be supplied by the State or local governments, or private non-profit organizations, such as CAAs, under third-party contracts with the State welfare agency.

Legal Services (45 C.F.R. 221.9(b) (14)

Legal services or attorneys to assure that FEA or other energy-related requirements are fully enforced also appears authorized. These services could be operated by State or local agencies, or could be contracted for with community or consumer groups.

(b) Emergency Services

The Emergency Assistance Program (EAP) also authorizes services to AFDC and actual and potential AFDC recipients. Unlike payments, the required non-Federal share for services is 75 percent. EAP services may be provided by the State, local government or non-profit organizations under third-party contracts, and are clearly available for crisis intervention programs.

II. Food Stamps

In computing a family's income for the purposes of determining the amount of its food stamp payment, shelter and utility costs in excess of 30 percent of family income are excluded. This means that food stamp recipients should maintain careful records of their energy costs because where those costs exceed 30 percent of their income. they are subtracted for food stamp purposes.

III. Department of Housing and Urban Development

A. Community Development Act

Under Section 105 of the Housing and Community Development Act of 1974, units of local government re-

ceiving funds could develop components of their overall community development programs to provide for insulating or winterizing homes of low income persons, and perhaps to provide services of the kinds described above which are available from State welfare agencies. To be noted is the fact that Section 105 funds can be legally used as non-Federal share. Accordingly, in those areas where such funds were used for programs which could be financially supported by State welfare agencies, 100 percent Federal financing for such efforts could be arranged. For example, Section 105 funds could be used to match the program for AFDC recipients providing up to $500 for insulation, so that a 100 percent Federally financed program could result. States are also eligible for Community Development Act funds (section 107), but on a discretionary basis. Such funds may also be used to match other Federal assistance program monies. As with Section 105, to be able to use Community Development Act funds as non-Federal share, an overall plan or program including those funds and others must be developed.

B. Other Housing and Urban Development Programs

Loan funds under Section 312 of the Housing Act of 1964 (42 U.S.C. 1452(b)) are low-interest (3 percent), 20-year loans, limited to rehabilitated property located in urban renewal or concentrated code enforcement areas. In addition, the property must conform to applicable building code requirements or carry out the objectives of the urban renewal plan. While these restrictions may limit the use of 312 loans for winterizing the homes of many low-income urban dwellers, 312 may be utilized in urban renewal and code enforcement areas.

Non-profit housing development sponsors may be eligible for HUD's Section 23 program, which is a currently funded housing subsidization program. While local groups would have to work through their local housing authorities, the Section 23 program could be extremely valuable as a new source for low-income housing.

IV. Farmers Home Administration (504) Loans

Under Section 504 of the Housing Act of 1949, one percent interest loans, up to $2,500 for ten years, may be made by FmHA to eligible rural residents. Recipients do not have to be farmers. Loans can be used for insulation materials and general winterizing.

It should be noted that in some States, FmHA is hesitant to make a loan for a substandard dwelling unless, after the loan, the dwelling unit will meet code enforcement standards. However, this is not a requirement of the law or of stated FmHA policy. In at least one State (Maine), through the urgings of Project FUEL, the State FmHA Director has reminded all FmHA county supervisors that a 504 loan can be made, so long as the dwelling would not likely continue to be a substantial hazard to the family.

CAAs, consumer groups and voluntary organizations have used their own staffs to act as 504 loan packagers for eligible recipients. While eligibility for each loan will continue to be determined by FmHA officials, CAA and citizen packagers have assisted FmHA county supervisors with loan application forms, and, thus greatly reduced FmHA processing time.

There are also some non-profit CSA-funded Housing Development Corporations which can advance the front-end money to recipients awaiting completion of 504 loan packages. For example, in the six-state New England region, the New England Non-Profit Housing Corporation has advanced funds to persons making winterization repairs which can then be repaid through the process of a 504 loan.

V. Department of Labor

The Comprehensive Employment and Training Act of 1973 (CETA) and the recently enacted Emergency Jobs and Unemployment Assistance Act of 1974 provide States jurisdictions with a population of 100,000 or more with funds to hire or train eligible persons. The Labor Department has determined that trainees and public service employees in programs financed by these two statutes can be used to work on projects to insulate homes of low income people.

VI. Department of Commerce

Two provisions of the Public Works and Economic Development Act of 1965, as amended, administered by the Economic Development Administration, have applicability. First, under Title IX of the Act (42 U.S.C.A. 3242) "Special economic development and adjustment assistance programs" are available to help States and localities experiencing actual or threatened severe unemployment. Grants are authorized to redevelopment areas, economic development districts, Indian tribes, States, crities and other local governments for: public facilities, public services, business development, planning, unemplovment compensation to persons not otherwise eligible, rent supplements, mortgage payment assistance research, technical assistance, training and relocation of persons. It appears, accordingly, that many services provided by CAAs which are related to energy, could be financed under this provision.

The other applicable provision is a new Title X, added by the Emergency Jobs and Unemployment Assistance Act of 1974, entitled, "Job Opportunities Program: (JOP). JOP's purpose is to provide emergency financial assistance to stimulate, maintain or expand job creating activities in redevelopment areas or in areas where the unemployment rate has been at least 6.5 percent for three consecutive months. CSA was invited to submit applications during the second round of funding. Many grantees applied for labor costs of weatherization efforts. We will have to await final determination about support of these projects.

CSA PAMPHLET 6143-6 SEP 75

Community Services Administration
1200 19th Street, NW
Washington, D.C. 20506

Appendix C:

For More Information About Materials

It has not been one of the purposes of this Guide to provide you with a considerable information about the various materials available on the market. You will need to have a person who is informed on this subject, in order to make your choices based on local factors which we have mentioned. But if you do run into a problem about which you cannot find a satisfactory answer, we recommend that you contact the appropriate manufacturers association listed below, rather than a particular manufacturer whose information might be biassed. Key associations are:

NATIONAL MINERAL WOOL ASSOCIATION
382 Springfield Avenue
Summit, New Jersey 07901

NATIONAL CELLULOSE INSULATION MANUFACTURERS ASSOCIATION
400 West Madison Street
Chicago, Illinois 60606

PERLITE INSTITUTE
45 West 45th Street
New York, New York 10036

NATIONAL PARTICLEBOARD ASSOCIATION
711 Fourteenth Street, N.W.
Washington, D.C. 20005

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Appendix D.

Building Weatherization Plan

(The following two pages are a reproduction of the Building Weatherization Plan which is being printed separately on both sides of one legal-sized page.)

Bibliography

Title	Available Through:
Coping With the Energy Crisis	Community Services Administration 1200 19th Street N.W. Washington, D.C. 20506
Save Energy: Save Money!	Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402 SD Cat. No. C13 29/2:64
Retrofitting Existing Housing for Energy Conservation: An Economic Analysis (National Bureau of Standards Building Science Series #64)	SD Cat. No. C13.53:8
Making the Most of Your Energy Dollars in Home Heating and Cooling (National Bureau of Standards)	U.S. Department of Housing and Urban Development Washington, D.C. 20410
In the Bank . . . or Up the Chimney?	

Building Weatherization Plan

Name and address of Owner (if not occupant):

Name of Head of Household:_____ Street Address: _____

I. BUILDING DESCRIPTION

Length _____ft. (X) Width _____ft. = Floor Area _____sq.ft.

Height of rooms _____ft. Length of exposed heating ducts: _____ft

Number of Doors: _____ Perimeter of _____ = _____ft

Number and size of Windows:

#	L	W	AREA	#	L	W	AREA	#	L	W	AREA

Approx. Age of Bldg. _____ Number of Rooms_____ Rooms used in Winter:____

Attic Vented:____yes ____no Attic Accessible:____yes ____no

Foundation:____cellar ____slab ____crawl space

Exterior:____frame ____masonry ____other

Roof:____shakes ____tar paper ____metal ____asphalt shingle

II. HEATING SYSTEM AND ENERGY COST INFORMATION

Which winter mo./yr.? ____/____

Type and Cost of Fuel (P = Primary, S = Secondary)

Type	Monthly Cost	Type	Monthly Cost
Fuel Oil	Amt:____gals. $____	Coal/Coke	Amt:____Tons $____
Nat.Gas	Amt:____therms	Nat.Gas	Amt:____lbs. $____
Kerosene	Amt:____gals. $____	Elect.	Amt:____Kw/Hr $____
Wood	Amt:____cords $____	Other_____	Amt:____ $____

Type of Heat: ____steam/water, ____air, ____stove, ____fireplace, ____other

Hot Water: ____yes, ____no; Supplied by:____gas, ____elect., ____furnace

CSA Test Form Oct 1975

III. INFILTRATION PROBLEMS: CIRCLE THE BEST DESCRIPTION OF BUILDING

BUILDING COMPONENT	Ideal	CONDITION	Worse (describe)	MATERIALS/COST TO REPAIR
CELLAR OR	Tight, no cracks, caulked sills, sealed cellar windows, no grade entrance leaks	Stone foundation cracks, no weather stripping on cellar windows, grade entrance not tight	Stone foundation, considerable leakage area, poor seal around grade entrance	
CRAWL SPACE	Plywood floor, no trap door leaks, no leaks around water, sewer and electrical openings	Tongue and groove board floor, reasonable fit on trap doors, around pipes, etc.	Board floor, loose fit around pipes, etc.	
WINDOWS	Storm windows with good fit	No storm window good fit on regular windows	No storm windows, loose fit on regular windows	
DOORS	Good fit on storm doors	Loose storm doors, poor fit on inside door	No storm doors-loose fit on inside door	
WALLS	Caulked windows and doors building paper used under siding	Caulking in poor repair, building needs paint	No indication of building paper, evident cracks around door and window frame	
ROOF	Snow stays on roof	Snow melts quickly	Holes - loose fitting	

Cost for Weather Stripping and Caulking (if not included above) _____

Total Cost for Correcting Infiltration _____

Cost for Repair or Replacement of Heating Source _____

Subtotal _____

Subtract Amount financed from other sources _____

Name of other Source _____

Total Cost of Stopping Infiltration to be Paid by this Program _____

BUILDING WEATHERIZATION PLAN (page two)

HEATING INDEX ☐ Administering Agency Grantee No.:_____

Date Plan Completed:___/___/___ Date Work Scheduled:___/___/___

COLUMN I: Optional	(minus) —	COLUMN II: Existing	(equals) —	COLUMN III: Needed	(minus) —	COLUMN IV: This Year	(equals) —	COLUMN V: Completed
Attic Insulation: R - ____ Inches Type A:____ Inches Type B:____ Inches Type C:____		**Attic Insulation:** R - ____ Inches:____ Type: ____		**Attic:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____		**Attic:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____		**Attic:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____
Floor Insulation: R - ____ Inches: ____		**Floor Insulation:** R - ____ Inches: ____		**Floor:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____		**Floor:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____		**Floor:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____
Wall Insulation: R - ____ Inches: ____		**Wall Insulation:** R - ____ Inches: ____		**Walls:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____		**Walls:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____		**Walls:** R-____ = ____in. Cost/sq.ft:____ X # sq.ft:____ = COST: $____
Duct Insulation: R - ____ Inches: ____		**Duct Insulation:** R - ____ Inches: ____		**Ducts:** R-____ = ____in. Cost/sq.ft: ____ Length X 1.5____ X Perimeter: ____ = COST: $____		**Ducts:** R-____ = ____in. Cost/sq.ft:____ X Length X 1.5____ X Perimeter: ____ = COST: $____		**Ducts:** R-____ = ____in. Cost/sq.ft:____ X Length X 1.5____ X Perimeter: ____ = COST: $____
Storm Windows Minimum Economical Size: _____sq.ft # Windows:_____		**Storm Windows** # Storm Windows:_____		**Storm Windows** Cost per: ____ X # Windows: ____ = COST: $____		**Storm Windows** Cost per: ____ X # Windows: ____ = COST: $____		**Storm Windows** Cost per: ____ X # Windows: ____ = COST: $____
Storm Doors yes no # doors:____		**Storm Doors** # Storm Doors:____		**Storm Doors** Cost per: ____ X # Doors: ____ = COST: $____		**Storm Doors** Cost per: ____ X # Doors: ____ = COST: $____		**Storm Doors** Cost per: ____ X # Doors: ____ = COST: $____
				TOTAL MATERIALS COST: $____		TOTAL MATERIALS COST: $____		TOTAL MATERIALS COST: $____
				INFILTRATION COSTS: (from page one) $____		INFILTRATION COSTS: (from page one) $____		INFILTRATION COSTS: (from page one) $____
				LABOR COSTS (if any): $____		LABOR COSTS (if any): $____		LABOR COSTS (if any): $____
				GRAND TOTAL: $____		GRAND TOTAL: $____		GRAND TOTAL: $____

COMPLETION DATA

Date Work Completed: ___/___/___ Total Cost: $_____

Work Completed per COLUMN IV? Yes No* *Column V conform?

Man-hours of Labor:____C.E.T.A.,____Title X,____WYC,____Volunteers

____Program Funds,____Project Mainstream,____Other

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